SEQUENCE LISTING

(1)   GENERAL INFORMATION:

    (i)   APPLICANT: LAFFEND, LISA ANNE
                    NAGARAJAN, VASANTHA
                    NAKAMURA, CHARLES

    (ii)   TITLE OF INVENTION: BIOCONVERSION OF A FERMENTABLE
                                 CARBON SOURCE TO 1,3-PROPANE-
                                 DIOL BY A SINGLE MICROORGANISM

    (iii)   NUMBER OF SEQUENCES: 46

    (iv)   CORRESPONDENCE ADDRESS:
        (A)   NAME: E. I. DUPONT DE NEMOURS AND COMPANY
        (B)   STREET: 1007 MARKET STREET
        (C)   CITY: WILMINGTON
        (D)   STATE: DELAWARE
        (E)   COUNTRY: U.S.A.
        (F)   ZIP: 19898

    (iv)   CORRESPONDENCE ADDRESS:
        (A)   NAME: GENENCOR INTERNATIONAL, INC.
        (B)   STREET: 4 CAMBRIDGE PLACE
                       1870 SOUTH WINTON ROAD
        (C)   CITY: ROCHESTER
        (D)   STATE: NEW YORK
        (E)   COUNTRY: U.S.A.
        (F)   ZIP: 14618

    (v)   COMPUTER READABLE FORM:
        (A)   MEDIUM TYPE: 3.50 INCH DISKETTE
        (B)   COMPUTER: IBM
        (C)   OPERATING SYSTEM: MICROSOFT WINDOWS 95
        (D)   SOFTWARE: MICROSOFT WORD 7.0A

    (vi)   CURRENT APPLICATION DATA:
        (A)   APPLICATION NUMBER:
        (B)   FILING DATE:
        (C)   CLASSIFICATION:

    (vii)   PRIOR APPLICATION DATA:
        (A)   APPLICATION NUMBER: 08/440,293
        (B)   FILING DATE: MAY 12, 1995

    (viii) ATTORNEY/AGENT INFORMATION:
        (A)   NAME: LINDA AXAMETHY FLOYD
        (B)   REGISTRATION NUMBER: 33,692
        (C)   REFERENCE/DOCKET NUMBER: CR9715 US DIV1

    (ix)   TELECOMMUNICATION INFORMATION:
        (A)   TELEPHONE: 302-892-8112
        (B)   TELEFAX: 302-773-0164

(2)   INFORMATION FOR SEQ ID NO:1:

      (i)   SEQUENCE CHARACTERISTICS:
         (A)   LENGTH: 12145 base pairs
         (B)   TYPE: nucleic acid
         (C)   STRANDEDNESS: single
         (D)   TOPOLOGY: linear

      (ii)   MOLECULE TYPE: DNA (genomic)

      (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:1:

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GCCCGCGGCC TGAATCACGT CGAAGTCACC TTTGAAAGTC AGCATCAGTT TGTCGATGCG      3060

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67

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68

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70

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71

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72

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(2)   INFORMATION FOR SEQ ID NO:2:

    (i)   SEQUENCE CHARACTERISTICS:
        (A)   LENGTH: 30 base pairs
        (B)   TYPE: nucleic acid
        (C)   STRANDEDNESS: single
        (D)   TOPOLOGY: linear

    (ii)   MOLECULE TYPE: DNA (genomic)

    (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:2:

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(2)   INFORMATION FOR SEQ ID NO:3:

    (i)   SEQUENCE CHARACTERISTICS:
        (A)   LENGTH: 29 base pairs
        (B)   TYPE: nucleic acid
        (C)   STRANDEDNESS: single
        (D)   TOPOLOGY: linear

    (ii)   MOLECULE TYPE: DNA (genomic)

    (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:3:

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(2)   INFORMATION FOR SEQ ID NO:4:

    (i)   SEQUENCE CHARACTERISTICS:
        (A)   LENGTH: 30 base pairs
        (B)   TYPE: nucleic acid
        (C)   STRANDEDNESS: single
        (D)   TOPOLOGY: linear

    (ii)   MOLECULE TYPE: DNA (genomic)

    (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:4:

```
GCGAATTCAT GCAACAGACA ACCCAAATTC                                                30
```

(2)   INFORMATION FOR SEQ ID NO: 5:

    (i)   SEQUENCE CHARACTERISTICS:
        (A)   LENGTH: 25 base pairs

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                    (B)  TYPE:  nucleic acid
                    (C)  STRANDEDNESS:  single
                    (D)  TOPOLOGY:  linear

            (ii)  MOLECULE TYPE:  DNA (genomic)

            (xi)  SEQUENCE DESCRIPTION:  SEQ ID NO:5:

GCGAATTCAC TCCCTTACTA AGTCG                                          25

(2)    INFORMATION FOR SEQ ID NO: 6:

            (i)   SEQUENCE CHARACTERISTICS:
                    (A)  LENGTH:  27 base pairs
                    (B)  TYPE:  nucleic acid
                    (C)  STRANDEDNESS:  single
                    (D)  TOPOLOGY:  linear

            (ii)  MOLECULE TYPE:  DNA (genomic)

            (xi)  SEQUENCE DESCRIPTION:  SEQ ID NO:6:

GCGAATTCAT GAGCTATCGT ATGTTTG                                        27

(2)    INFORMATION FOR SEQ ID NO:7:

            (i)   SEQUENCE CHARACTERISTICS:
                    (A)  LENGTH:  28 base pairs
                    (B)  TYPE:  nucleic acid
                    (C)  STRANDEDNESS:  single
                    (D)  TOPOLOGY:  linear

            (ii)  MOLECULE TYPE:  DNA (genomic)

            (xi)  SEQUENCE DESCRIPTION:  SEQ ID NO:7:

GCGAATTCAG AATGCCTGGC GGAAAATC                                       28

(2)    INFORMATION FOR SEQ ID NO:8:

            (i)   SEQUENCE CHARACTERISTICS:
                    (A)  LENGTH:  28 base pairs
                    (B)  TYPE:  nucleic acid
                    (C)  STRANDEDNESS:  single
                    (D)  TOPOLOGY:  linear

            (ii)  MOLECULE TYPE:  DNA (genomic)

            (xi)  SEQUENCE DESCRIPTION:  SEQ ID NO:8:

GGGAATTCAT GAGCGAGAAA ACCATGCG                                       28

(2)    INFORMATION FOR SEQ ID NO:9:

            (i)   SEQUENCE CHARACTERISTICS:
                    (A)  LENGTH:  27 base pairs
                    (B)  TYPE:  nucleic acid
```

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                    (C)   STRANDEDNESS:  single
                    (D)   TOPOLOGY:  linear

            (ii)    MOLECULE TYPE:  DNA (genomic)

            (xi)    SEQUENCE DESCRIPTION:  SEQ ID NO:9:

GCGAATTCTT AGCTTCCTTT ACGCAGC                                27

    (2)     INFORMATION FOR SEQ ID NO:10:

            (i)     SEQUENCE CHARACTERISTICS:
                    (A)   LENGTH:  94 base pairs
                    (B)   TYPE:  nucleic acid
                    (C)   STRANDEDNESS:  single
                    (D)   TOPOLOGY:  linear

            (ii)    MOLECULE TYPE:  DNA (genomic)

            (xi)    SEQUENCE DESCRIPTION: SEQ ID NO:10:

AGCTTAGGAG TCTAGAATAT TGAGCTCGAA TTCCCGGGCA TGCGGTACCG GATCCAGAAA    60

AAAGCCCGCA CCTGACAGTG CGGGCTTTTT TTTT                        94

    (2)     INFORMATION FOR SEQ ID NO:11:

            (i)     SEQUENCE CHARACTERISTICS:
                    (A)   LENGTH:  33 base pairs
                    (B)   TYPE:  nucleic acid
                    (C)   STRANDEDNESS:  single
                    (D)   TOPOLOGY:  linear

            (ii)    MOLECULE TYPE:  DNA (genomic)

            (xi)    SEQUENCE DESCRIPTION:  SEQ ID NO:11:

GGCCAAGCTT AAGGAGGTTA ATTAAATGAA AAG                         33

    (2)     INFORMATION FOR SEQ ID NO:12:

            (i)     SEQUENCE CHARACTERISTICS:
                    (A)   LENGTH:  26 base pairs
                    (B)   TYPE:  nucleic acid
                    (C)   STRANDEDNESS:  single
                    (D)   TOPOLOGY:  linear

            (ii)    MOLECULE TYPE:  DNA (genomic)

            (xi)    SEQUENCE DESCRIPTION:  SEQ ID NO:12:

GCTCTAGATT ATTCAATGGT GTCGGG                                 26

    (2)     INFORMATION FOR SEQ ID NO:13:

            (i)     SEQUENCE CHARACTERISTICS:
                    (A)   LENGTH:  42 base pairs
                    (B)   TYPE:  nucleic acid
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                    (C)  STRANDEDNESS:  single
                    (D)  TOPOLOGY:  linear

          (ii)  MOLECULE TYPE:  DNA (genomic)

          (xi)  SEQUENCE DESCRIPTION:  SEQ ID NO:13:

     GCGCCGTCTA GAATTATGAG CTATCGTATG TTTGATTATC TG                    42

     (2)    INFORMATION FOR SEQ ID NO:14:

          (i)  SEQUENCE CHARACTERISTICS:
                    (A)  LENGTH:  36 base pairs
                    (B)  TYPE:  nucleic acid
                    (C)  STRANDEDNESS:  single
                    (D)  TOPOLOGY:  linear

          (ii)  MOLECULE TYPE:  DNA (genomic)

          (xi)  SEQUENCE DESCRIPTION:  SEQ ID NO:14:

     TCTGATACGG GATCCTCAGA ATGCCTGGCG GAAAAT                           36

     (2)    INFORMATION FOR SEQ ID NO:15:

          (i)  SEQUENCE CHARACTERISTICS:
                    (A)  LENGTH:  181 base pairs
                    (B)  TYPE:  nucleic acid
                    (C)  STRANDEDNESS:  single
                    (D)  TOPOLOGY:  linear

          (ii)  MOLECULE TYPE:  DNA (genomic)

          (xi)  SEQUENCE DESCRIPTION:  SEQ ID NO:15:

CGATCTGTGC TGTTTGCCAC GGTATGCAGC ACCAGCGCGA GATTATGGGC TCGCACGCTC    60

GACTGTCGGA CGGGGGCACT GGAACGAGAA GTCAGGCGAG CCGTCACGCC CTTGACAATG    120

CCACATCCTG AGCAAATAAT TCAACCACTA AACAAATCAA CCGCGTTTCC CGGAGGTAAC    180

C                                                                    181

     (2)    INFORMATION FOR SEQ ID NO:16:

          (i)  SEQUENCE CHARACTERISTICS:
                    (A)  LENGTH:  149 base pairs
                    (B)  TYPE:  nucleic acid
                    (C)  STRANDEDNESS:  single
                    (D)  TOPOLOGY:  linear

          (ii)  MOLECULE TYPE:  DNA (genomic)

          (xi)  SEQUENCE DESCRIPTION:  SEQ ID NO:16:

CGATCTGTGC TGTTTGCCAC GGTATGCAGC ACCAGCGCGA GATTATGGGC TCGCACGCTC    60

GACTGTCGGA CGGGGGCACT GGAACATGCC ACATCCTGAG CAAATAATTC AACCACTAAA    120
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CAAATCAACC GCGTTTCCCG GAGGTAACC   149

(2)   INFORMATION FOR SEQ ID NO:17:

        (i)   SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 33 base pairs
                (B) TYPE: nucleic acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:17:

GGAATTCACT AGTCGATCTG TGCTGTTTGC CAC   33

(2)   INFORMATION FOR SEQ ID NO:18:

        (i)   SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 33 base pairs
                (B) TYPE: nucleic acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:18:

GGGGAAGCTT GGTTACCTCC GGGAAACGCG GTT   33

(2)   INFORMATION FOR SEQ ID NO:19:

        (i)   SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 16 base pairs
                (B) TYPE: nucleic acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:19:

TCGACCACAA GGAGGA   16

(2)   INFORMATION FOR SEQ ID NO:20:

        (i)   SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 16 base pairs
                (B) TYPE: nucleic acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:20:

CTAGTCCTCC TTGTGG   16

(2)   INFORMATION FOR SEQ ID NO:21:

        (i)   SEQUENCE CHARACTERISTICS:
                (A)   LENGTH: 45 base pairs
                (B)   TYPE: nucleic acid
                (C)   STRANDEDNESS: single
                (D)   TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:21:

ACTGGCCGTC GTTTTACTCG AGTCGTGACT GGGAAAACCC TGGCG   45

(2)   INFORMATION FOR SEQ ID NO:22:

        (i)   SEQUENCE CHARACTERISTICS:
                (A)   LENGTH: 14 base pairs
                (B)   TYPE: nucleic acid
                (C)   STRANDEDNESS: single
                (D)   TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:22:

AATTCAAAGG AGGT   14

(2)   INFORMATION FOR SEQ ID NO:23:

        (i)   SEQUENCE CHARACTERISTICS:
                (A)   LENGTH: 14 base pairs
                (B)   TYPE: nucleic acid
                (C)   STRANDEDNESS: single
                (D)   TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:23:

CTAGACCTCC TTTG   14

(2)   INFORMATION FOR SEQ ID NO:24:

        (i)   SEQUENCE CHARACTERISTICS:
                (A)   LENGTH: 19 base pairs
                (B)   TYPE: nucleic acid
                (C)   STRANDEDNESS: single
                (D)   TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:24:

AGCTTGTCGA CCATGAAAA   19

(2)   INFORMATION FOR SEQ ID NO:25:

          (i)   SEQUENCE CHARACTERISTICS:
                 (A)   LENGTH: 19 base pairs
                 (B)   TYPE: nucleic acid
                 (C)   STRANDEDNESS: single
                 (D)   TOPOLOGY: linear

          (ii)   MOLECULE TYPE: DNA (genomic)

          (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:25:

GATCTTTTCA TGGTCGACA   19

(2)   INFORMATION FOR SEQ ID NO:26:

          (i)   SEQUENCE CHARACTERISTICS:
                 (A)   LENGTH: 13 base pairs
                 (B)   TYPE: nucleic acid
                 (C)   STRANDEDNESS: single
                 (D)   TOPOLOGY: linear

          (ii)   MOLECULE TYPE: DNA (genomic)

          (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:26:

TCGACCAGGA GGA   13

(2)   INFORMATION FOR SEQ ID NO:27:

          (i)   SEQUENCE CHARACTERISTICS:
                 (A)   LENGTH: 13 base pairs
                 (B)   TYPE: nucleic acid
                 (C)   STRANDEDNESS: single
                 (D)   TOPOLOGY: linear

          (ii)   MOLECULE TYPE: DNA (genomic)

          (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:27:

CTAGTCCTCC TGG   13

(2)   INFORMATION FOR SEQ ID NO:28:

          (i)   SEQUENCE CHARACTERISTICS:
                 (A)   LENGTH: 18 base pairs
                 (B)   TYPE: nucleic acid
                 (C)   STRANDEDNESS: single
                 (D)   TOPOLOGY: linear

          (ii)   MOLECULE TYPE: DNA (genomic)

          (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:28:

TCGACGAATT CAGGAGGA   18

(2)   INFORMATION FOR SEQ ID NO:29:

        (i)   SEQUENCE CHARACTERISTICS:
                (A)   LENGTH: 18 base pairs
                (B)   TYPE: nucleic acid
                (C)   STRANDEDNESS: single
                (D)   TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:29:

CTAGTCCTCC TGAATTCG   18

(2)   INFORMATION FOR SEQ ID NO:30:

        (i)   SEQUENCE CHARACTERISTICS:
                (A)   LENGTH: 23 base pairs
                (B)   TYPE: nucleic acid
                (C)   STRANDEDNESS: single
                (D)   TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:30:

ATGTACAAGA TCCTGATCGC CGA   23

(2)   INFORMATION FOR SEQ ID NO:31:

        (i)   SEQUENCE CHARACTERISTICS:
                (A)   LENGTH: 22 base pairs
                (B)   TYPE: nucleic acid
                (C)   STRANDEDNESS: single
                (D)   TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:31:

TCAGCGGCGC AGGTAGGCGG CG   22

(2)   INFORMATION FOR SEQ ID NO:32:

        (i)   SEQUENCE CHARACTERISTICS:
                (A)   LENGTH: 31 base pairs
                (B)   TYPE: nucleic acid
                (C)   STRANDEDNESS: single
                (D)   TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:32:

ATGACCAAGG GCCGGATCCG TCGACCTGCA G   31

(2)   INFORMATION FOR SEQ ID NO:33:

        (i)   SEQUENCE CHARACTERISTICS:
               (A)   LENGTH: 32 base pairs
               (B)   TYPE: nucleic acid
               (C)   STRANDEDNESS: single
               (D)   TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:33:

CTACCCTTGG CCCCGGATCC GTCGACCTGC AG   32

(2)   INFORMATION FOR SEQ ID NO:34:

        (i)   SEQUENCE CHARACTERISTICS:
               (A)   LENGTH: 23 base pairs
               (B)   TYPE: nucleic acid
               (C)   STRANDEDNESS: single
               (D)   TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:34:

CACGGCCTGG CGCAGGTTGC GGG   23

(2)   INFORMATION FOR SEQ ID NO:35:

        (i)   SEQUENCE CHARACTERISTICS:
               (A)   LENGTH: 21 base pairs
               (B)   TYPE: nucleic acid
               (C)   STRANDEDNESS: single
               (D)   TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:35:

GGCAGCCCGC ACGATTGCGG C   21

(2)   INFORMATION FOR SEQ ID NO:36:

        (i)   SEQUENCE CHARACTERISTICS:
               (A)   LENGTH: 21 base pairs
               (B)   TYPE: nucleic acid
               (C)   STRANDEDNESS: single
               (D)   TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:36:

GCGGAAAACC GCCTGGATCG C   21

(2)   INFORMATION FOR SEQ ID NO:37:

            (i)   SEQUENCE CHARACTERISTICS:
                   (A)   LENGTH: 21 base pairs
                   (B)   TYPE: nucleic acid
                   (C)   STRANDEDNESS: single
                   (D)   TOPOLOGY: linear

            (ii)   MOLECULE TYPE: DNA (genomic)

            (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:37:

GGGTTCAGGG ACTGCAAAAC G   21

(2)   INFORMATION FOR SEQ ID NO:38:

            (i)   SEQUENCE CHARACTERISTICS:
                   (A)   LENGTH: 35 base pairs
                   (B)   TYPE: nucleic acid
                   (C)   STRANDEDNESS: single
                   (D)   TOPOLOGY: linear

            (ii)   MOLECULE TYPE: DNA (genomic)

            (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:38:

GGAATTCAGA TCTCAGCAAT GAAAAGATCA AAACG   35

(2)   INFORMATION FOR SEQ ID NO:39:

            (I)   SEQUENCE CHARACTERISTICS:
                   (A)   LENGTH: 34 base pairs
                   (B)   TYPE: nucleic acid
                   (C)   STRANDEDNESS: single
                   (D)   TOPOLOGY: linear

            (ii)   MOLECULE TYPE: DNA (genomic)

            (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:39:

GGAATTCAGA TCTCAGCAAT GCAACAGACA ACCC   34

(2)   INFORMATION FOR SEQ ID NO:40:

            (i)   SEQUENCE CHARACTERISTICS:
                   (A)   LENGTH: 28 base pairs
                   (B)   TYPE: nucleic acid
                   (C)   STRANDEDNESS: single
                   (D)   TOPOLOGY: linear

            (ii)   MOLECULE TYPE: DNA (genomic)

            (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:40:

GCTCTAGATC ACTCCCCTTA CTAAGTCG   28

(2)   INFORMATION FOR SEQ ID NO:41:

            (i)   SEQUENCE CHARACTERISTICS:
                   (A) LENGTH: 37 base pairs
                   (B) TYPE: nucleic acid
                   (C) STRANDEDNESS: single
                   (D) TOPOLOGY: linear

            (ii)   MOLECULE TYPE: DNA (genomic)

            (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:41:

GGAATTCAGA TCTCAGCAAT GAGCGAGAAA ACCATGC   37

(2)   INFORMATION FOR SEQ ID NO:42:

            (i)   SEQUENCE CHARACTERISTICS:
                   (A) LENGTH: 27 base pairs
                   (B) TYPE: nucleic acid
                   (C) STRANDEDNESS: single
                   (D) TOPOLOGY: linear

            (ii)   MOLECULE TYPE: DNA (genomic)

            (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:42:

GCTCTAGATT AGCTTCCTTT ACGCAGC   27

(2)   INFORMATION FOR SEQ ID NO:43:

            (i)   SEQUENCE CHARACTERISTICS:
                   (A) LENGTH: 38 base pairs
                   (B) TYPE: nucleic acid
                   (C) STRANDEDNESS: single
                   (D) TOPOLOGY: linear

            (ii)   MOLECULE TYPE: DNA (genomic)

            (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:43:

GGAATTCAGA TCTCAGCAAT GAGCTATCGT ATGTTTGA   38

(2)   INFORMATION FOR SEQ ID NO:44:

            (i)   SEQUENCE CHARACTERISTICS:
                   (A) LENGTH: 24 base pairs
                   (B) TYPE: nucleic acid
                   (C) STRANDEDNESS: single
                   (D) TOPOLOGY: linear

            (ii)   MOLECULE TYPE: DNA (genomic)

            (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:44:

GCTCTAGATC AGAATGCCTG GCGG   24

(2)   INFORMATION FOR SEQ ID NO:45:

        (i)   SEQUENCE CHARACTERISTICS:
               (A)   LENGTH: 35 base pairs
               (B)   TYPE: nucleic acid
               (C)   STRANDEDNESS: single
               (D)   TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:45:

GGAATTCAGA TCTAGCAATG CCGTTAATAG CCGGG   35

(2)   INFORMATION FOR SEQ ID NO:46:

        (i)   SEQUENCE CHARACTERISTICS:
               (A)   LENGTH: 26 base pairs
               (B)   TYPE: nucleic acid
               (C)   STRANDEDNESS single
               (D)   TOPOLOGY: linear

        (ii)   MOLECULE TYPE: DNA (genomic)

        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:46:

GCTCTAGATT AATTCGCCTG ACCGGC   26